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General Articles

THE LIFE-HISTORY OF THE SCAB MITE IN RELATION TO CONTROL MEASURES*

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The Cooper Technical Bureau, of which I am a member, has, for a number of years, been interested in the question of the life-history of the scab mite (*Psoroptes communis var. ovis*). We have often noticed that on sheep which have been heavily infected with scab in the winter, the disease, on the advent of spring, undergoes a spontaneous decrease of activity without any curative treatment; so that in the summer all visible signs of the disease may have disappeared and the sheep have apparently recovered, only to relapse again in the autumn. During the last four years I have been engaged on an experimental study of this subject and the results of my work have already been published, in part, in the current issue of the *Journal of Comparative Pathology and Therapeutics*.

I do not propose to give a detailed account to-day but just a brief outline and to try to show what bearing the life-history has on control measures.

Sheep-scab is one of the oldest known diseases of sheep. Reference to it will be found in the Bible and the writings of Roman authors on agricultural subjects. It was, however, only in 1809 that the causal parasite was discovered and described by G. H. Walz, a German veterinary surgeon. Many other observers, of whom perhaps the chief were Gerlach, A. W. Shilston and Stockman and Berry, have added to our knowledge of the parasite.

The disease is characterised by an intense irritation of the skin and the formation of vesicles and pustules, caused by the feeding of the mites. The vesicles rupture, crusts are formed and shedding of the wool occurs, with possible death from debility and exhaustion.

I expect you are all familiar with the general details of the life-cycle of the scab mite, comprising the egg, larva, nymph, pubescent female, male and ovigerous female. This life-cycle was ably worked out by A. W. Shilston in Natal. He found it occupied a period of eleven days from egg to egg. In my own experiments I found the total period was the same, but that the time from the first appearance of the larva to the resultant egg was eight days, as compared with Shilston's nine. The difference appears to be that in my experiments the eggs took a day longer to hatch and the nymphal stage was a day shorter.

One of the most interesting results from the experimental work was the relative rate of oviposition of the female. Although the total number of eggs laid was constant, between 35-40 eggs per female, the rate at which they were laid varied considerably. For instance (*a*) one female lived 42 days and laid 35 eggs in 29 days at an average rate of 1·2 eggs per day; (*b*) another female lived eleven days and laid 39 eggs in seven days at a rate of 5·59 eggs per day; (*c*) in a third case five females laid sixteen eggs in six days at an average of 0·5 eggs per day. In this last case the complete lives of the females were not observed. The factor which appeared to control this variation was the atmospheric temperature. For example, in the first case the average minimum temperature during oviposition was 33·8° F., in the second case 25·9° F., and the third case was observed during the summer. In other words, the colder the weather the greater was the rate of egg-laying and the shorter the life of the female. This bears out our general observation that scab is most active under wintry conditions.

It is believed by some people that the advent of wet weather increases the activity of the disease. There does not appear to be any evidence for this belief. In February and March of 1933 and 1934, considerable rain fell at Little Gaddesden, where we have our Research Station, and yet scab was becoming latent. July, 1934, was a rainy month, yet latency was well established. November and December, 1933, were very dry and the disease was very active.

As I have already stated, the object of this work was to try to ascertain how and why this latent phase occurred. During the summers of 1933, 1934 and 1935, I had eleven scab-infected sheep under observation. All these sheep had had the disease during the previous winter and the lesions had extended widely over the body surface.

The first signs of the approach of latency occurred towards the end of February and the beginning of March, when, although the sheep were still showing symptoms of the disease, such as rubbing and scratching, the mites were exceedingly difficult to find. Towards the end

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of May, all clinical symptoms of the disease had disappeared and the sheep looked quite healthy, yet on eight of the eleven sheep, during the whole of the summer, mites could be found, if a sufficiently careful search were made. Of these eight, five relapsed again into active cases of scab in the autumn and early winter, one died and two were dipped during the latent period. Although mites could be found on the remaining three of the original eleven up to July or August, the disease finally died out; the sheep remained free, in isolation, two to the following November, when they were reinfected, and the third to the following January.

From these observations, one may gather that it is possible for sheep to harbour mites during the whole of the summer, without showing any symptoms of the disease, and for the disease to break out again in the following winter.

It is interesting to observe the sites where the acari were found during the summer. In some cases they were found on the body surface in the wrinkled folds of skin, where an ordinary dipping would have dealt with them. But of great importance was the fact that some of these sheep were completely clean except for a colony of mites in such places as the infraorbital fossae and the inguinal folds, which are well developed in the Hampshire breed. Other possible sites are the wrinkled scrotum of the castrated male or the tail in the long-tailed sheep. When the disease became active again in the autumn, the acari showed a marked tendency to forsake these sites for the general body surface.

To turn now to an explanation of this phenomenon—the irritation produced in this disease is undoubtedly caused by the acari while feeding, as is evident from the production of vesicles and pustules at the sites where they have fed. The immature mites feed continuously throughout the active phase of their existence, that is, up to the time they commence to moult and no moult lasts more than 24 hours. The ovigerous female engorges quickly after emergence from the pubescent skin and thereafter feeds very little, if at all.

When examining these latent sheep, the preponderance of ovigerous females was very striking. Eggs and immature stages were scanty. This is the exact opposite to what one finds in the winter when the disease is active. If you will carry your minds back to what I have already said in connection with the influence of temperature on the rate of oviposition, and the length of life of the ovigerous female, the explanation becomes clear. Should few or no feeding mites be present, there will be little or no irritation and few if any symptoms of the disease. Further, there does not seem to be evidence of any lengthening of the life-cycle in the summer months, with one possible exception, and thus, because of the sparseness of immature stages at this season, it is improbable that a pubescent female will find a male immediately available with which to mate and so may have to wait until a male emerges.

Having briefly reviewed the salient points of the life-history of the mite, let us now consider control measures. These may be divided into (*a*) Curative and (*b*) Preventive.

Curative Treatment.—It is recognised by all authorities that a single dipping will rarely cure scab. The reason for this is that there is no dip which will, with certainty, sterilise the eggs. The usual practice, therefore, is to give a second dipping ten days after the first, with the object of killing any mites which may have hatched out subsequent to the first dipping, before they have reached the ovigerous stage and commenced to lay eggs.

From what I have previously said, it might appear that ten days is too long an interval if only eight days elapse from the appearance of the larva to the commencement of oviposition. There are, however, two factors to be considered. I have proved by experiment that the artificial infection of recently dipped sheep generally results in failure to establish the disease. Sufficient dip remains in the fleece to kill any larvae which may hatch out within 24 to 48 hours after dipping. Secondly, under experimental conditions, males were always present as soon as the pubescent females emerged. If, however, the first dipping is carried out properly, only eggs should remain alive and all the immature and adult mites should have been killed. From eggs of the same generation, the males emerge two-and-a-half to three days after the pubescent females. They are also very much fewer in number, being in the proportion of approximately two males to seven females. Therefore, in these circumstances, the pubescent female must wait before mating can take place, and the ovigerous stage is not reached until after ten-and-a-half to eleven days instead of eight, making a ten-day interval satisfactory.

Preventive Treatment.—In this country all sheep have to be given either a single or double dipping some time during the months of July and August, according to the district and locality. As a personal expression of opinion only, I do not consider that this is the best time of the year to carry out a statutory dipping, for the following reasons.

Sheep may be harbouring mites without showing any symptoms of the disease in the summer months, and the mites are often found in parts of the body, such as the infra-orbital fossae, etc., which are not readily accessible to the dipping fluid; thus when a sheep is immersed in the dipping fluid for one minute, or, I am afraid, in many cases, for a much

shorter period, and the head ducked under once or twice, the chances of the fluid penetrating to those parts is highly improbable, especially as these places of refuge may be covered by a thick crust of dried skin secretions, under which the mites are present. The only hope of reaching the mites is by hand dressing before and after dipping, with the dipping fluid and a stiff brush or some such implement, in order to ensure complete control. I know this procedure was adopted by Mr. Verney in Basutoland. It is one thing where native labour is cheap, but I can hardly see a Welsh mountain farmer, who has one or two thousand sheep to dip, or an English farmer, for that matter, willingly undertaking this extra work and expense.

On the other hand, the mites show a marked tendency to migrate to the general body surface in the autumn and early winter, where they are more readily destroyed. For this reason I, personally, advocate a statutory dipping in late September, October or November. I know that all farmers would not agree with me on the score of safety and the upset to the lambs and sheep sales. To the first objection I would reply that in our own experience, which is very extensive, there is no danger in dipping sheep in wintry weather, provided the bath is used at the prevailing air temperature and not warmed. My reply to the second objection would be to ask, is one to make a determined effort to eradicate the disease or to allow secondary considerations to intervene?

ARMY VETERINARY SERVICE

Movements of Officers

Major G. Lloyd, D.S.O., F.R.C.V.S., sailed for Gibraltar on June 28th, for a tour of duty abroad, in relief of Major E. S. W. Peatt, *O.B.E.*, F.R.C.V.S., who has returned to this country, and assumed duty as Instructor at the Equitation School, Weedon, with effect from July 11th.

Major C. H. S. Townsend, *O.B.E.*, M.C., F.R.C.V.S., assumed duty on July 11th as Assistant Director-General, Army Veterinary Services, War Office, in succession to Brevet Lieut.-Colonel S. L. Slocock, M.C., F.R.C.V.S. Colonel Slocock is now doing duty at Hounslow.

Lieut.-Colonel E. G. Turner, D.S.O., who has been on leave ex-Egypt, was reverted to the Home establishment with effect from August 19th, on which date he assumed duty as Assistant Director of Veterinary Services, Northern Command, York.

Lieut.-Colonel J. J. M. Soutar, *O.B.E.*, sailed for Egypt on August 19th, for the purpose of assuming duty as Assistant Director of Veterinary Services, British Troops in Egypt.

Major T. Hodgins, who is at present in this country on leave ex-Malta, is being reverted to the Home establishment with effect from October 17th, on which date he will proceed to Edinburgh, for duty.

Major G. F. Steevenson and Captain F. L. Cundell are at present in this country on leave ex-India.

THE SEX HORMONES AND THEIR VALUE AS THERAPEUTIC AGENTS*

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In discussing the value of hormone therapy in the practice of obstetrics and gynaecology it is well to remember that hitherto this field of practice has been limited to the problems related to the generative organs. The field remains limited, but owing to the recent advances in the biochemistry and physiology of the sex hormones the problems now include a consideration of the whole endocrine system in the female.

Definition of Hormones

In the present day nomenclature the word "hormone" has largely replaced the more descriptive term "internal secretion." Hormones, then, may be defined as the specific secretions of certain organs, which are usually made up of glandular elements, that are secreted directly into the blood or lymphatic systems. Such products are not limited to the ductless glands, because the pancreas and testis, although possessing a duct system, also secrete hormones apart from the secretions liberated in the ducts. Taken literally, hormone means something which incites. This meaning should refer to action only, which may be either inhibition or stimulation. It now appears quite possible that one hormone may stimulate activity in some tissue cells and inhibit the action or the production of other hormones.

The Female Sex Hormones

The female homones are primarily concerned with an adaptation of the reproductive organs to a specialisation that has taken place in the body. In certain invertebrates the characteristic and only function of the ovary is that of egg production. There is no necessity for hormone action. In certain species of lower vertebrates the egg cells escape through the wall of the ovary to the outside, but as specialisation progresses oviducts are developed to make sure that such an exit is possible. It is in connection with the development and function of such passages that hormone secretion is necessary. The active principle of the oestrogenic substances is the hormone that is primarily concerned with the development and the function of these passages. This active principle is called "oestrin" in the present discussion, and the term is used to include all substances possessing oestrogenic activity.

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The liberation of egg cells in primitive species is accomplished quite regardless of timed cycles. As specialisation advances, internal insemination becomes an additional requirement in the sexual life of the organism. The reproductive passages are prepared for this act. The hormone "oestrin" controls the preparation of the passages, and it is therefore natural that the seat of hormone production is associated with the mechanism of egg production in order that the time of ovulation or egg release coincides with the proper preparation of the passages. The ovarian follicular mechanism is the site of oestrin production and egg release in the higher vertebrate forms, including the human being.

Oestrin alone appears to fulfil the hormonal obligations up to the stage where the embedding and subsequent nourishment of the developing embryo becomes a part of the function of the reproductive tract.

The action of oestrin may be summarised briefly at this point of the discussion. Oestrin stimulates the growth of smooth muscle, stratified epithelium, submucosal tissue and undifferentiated cylindrical epithelium, where such tissues are found in the Fallopian tubes, uterus, vagina, and breast. It appears to have a selectivity for these tissues in all mammals. In addition it is responsible in the human being for the appearance of the non-essential secondary characteristics, such as the distribution of the hair, the feminine demeanour, the skeletal changes which contribute to the feminine appearance and have to do with the mechanism of parturition.

A second hormone is produced by the ovarian follicle when it progresses to the stage known as the corpus luteum. This hormone is necessary for the embedding and nourishment of the fertilised ovum during the first stages of development. It is produced by the corpus luteum and is called "progesterone." Secretion of progesterone begins with the first appearance of the lutein change in the follicle at a time when the ovum has already been released and the conditions for fertilisation are optimum. Progesterone is concerned with the differentiative phase in the endometrium, a change which cannot be accomplished unless the endometrium has been previously developed by the action of oestrin.

It is not surprising, in view of the demands made on certain metabolic processes in the body by the developing foetus, that other endocrine systems in charge of such metabolic processes should be prepared for these requirements. The anterior pituitary gland has become the central controlling signal station for such a purpose. The anterior pituitary has assumed a co-operative control of the ovary through a balance between concentration of the ovarian hormones oestrin and progesterone, and the concentration of its own ovary-stimulating hormone, "gonadotropin," in the blood. A similar co-operative control is probably exercised in the case of the thyroid, the parathyroid, the adrenal, and the pancreas. In connection with the ovary, the balance of this co-operative control by the pituitary is a fine one, and appears to be concerned with the synchronising of the whole endocrine system for the event of fertilisation and the subsequent requirements of a developing foetus.

The Menstrual Cycle

The anterior pituitary stimulates the ovary by the production of the hormone gonadotropin. The ovary when so stimulated produces, by the action of its follicular apparatus, oestrin, which controls the proliferative phase of endometrial development. When the proliferative phase is almost complete the ovarian follicle normally changes to the corpus luteum body after ovulation occurs. The corpus luteum is formed by gonadotropic influence from the anterior pituitary and produces progesterone, which in turn develops the differentiative phase in the endometrium. The differentiative phase is only concerned with the embedding and nutrition of the fertilised ovum.

As the concentration of oestrin in the body rises the power of the anterior pituitary to stimulate follicular development and oestrin production is diminished. It is suggested that the rise in oestrin concentration is in a way responsible for the change from follicle-stimulating to luteinising power which is characteristic of the anterior pituitary hormone gonadotropin. In any case, the production of oestrin is diminished during the last few days of the cycle, when the endometrium is under the greatest influence of progesterone. With the physiological involution of the corpus luteum, in the absence of a pregnancy, resulting in the cessation of progesterone secretion and the withdrawal of its inhibitory effect on menstruation, the endometrium disintegrates and bleeding follows. The anterior pituitary regains its follicular stimulating ability in the presence of the lowered oestrin concentration at the time of menstruation, initiates new follicular development, and the cycle is repeated.

In considering the essential features of the cyclic changes which occur in the endometrium under the influence of oestrin and progesterone, one must keep in mind two important facts. First: oestrin is the more primitive of the two hormones, and, therefore, in the lower forms of life it controlled the reproductive tract in its entirety before specialisation for the purpose of retention of the developing embryo took place; second, it is not unnatural, therefore, to find that oestrin is still responsible for initiating the development of the endometrium

and that pure crystalline progesterone will not give its characteristic differentiative reaction in the absence of a well developed proliferative phase in the endometrium. Briefly, the proliferative phase produced by oestrin is characterised by mitosis, active cell division, resurfacing of the endometrium, and the formation of new straight tubular glands from the surface epithelium. The cells in the epithelium during this phase are of a moderately low columnar type, with the nucleus near the centre of the cell. By the end of the second week the endometrium is, grossly, about two mm. thick. In the absence of progesterone effect differentiation does not take place. The differentiative phase is characterised microscopically by a change to the high columnar type of epithelium, with the nuclei near the base of the cells, and a marked twisting of the form of the endometrial glands as a whole. These changes are due to a very definite cytoplasmic increase in the cell with a decrease in the nucleo-cystoplasmic ratio. In these tall cells there is an increased concentration of glycogenic material, which becomes a constituent of the secretion of the endometrial glands. The resulting secretion is undoubtedly concerned with the protection and early nourishment of the fertilised ovum.

If fertilisation occurs events have a natural sequence. The corpus luteum and the progesterone influence is maintained by the appearance of a new substance or a quantitative change in the gonadotropic hormone. In either case the fertilised ovum is considered to be responsible for the presence of this anterior-pituitary-like substance in greater concentration during the early months of pregnancy. It is called anterior-pituitary-like substance (A.P.L.) because it produces changes in the ovaries of intact immature experimental animals which are similar to those produced by gonadotropin from the anterior pituitary.

The Sources of Oestrin

In so far as the oestrin regulation of the menstrual cycle and the control exercised over the development of the secondary sex characteristics in the human being is concerned, the production of the required hormone depends upon the follicular apparatus of the ovary. The recent discovery of large amounts of oestrin in the urine of male animals, together with the fact that tissue from stallions' testicles has proved to be richer in oestrin than any other tissue examined (B. Zondek), proves that the substance is not peculiar to the female sex. It is also extensively produced in plants. During pregnancy, in both the human subject and the mare, it is excreted in the urine in large quantities, particularly during the later months. The urine of pregnant women and pregnant mares has been largely used as a commercial source of the hormone.

The Oestrogenic Compounds

The nomenclature of compounds showing oestrogenic activity has been complicated by the adoption of a variety of names by individual biochemists and pharmaceutical houses. "Oestrin" is a term which is used in this discussion to include all the compounds showing a degree of oestrogenic activity in the experimental animal. Some of these compounds are enumerated here: (1) Oestrone or ketohydroxyoestrin (theelin, oestroform, amniotin); (2) Oestriol or trihydroxyoestrin (theelol); (3) Oestradiol or dihydroestin; (4) Benzoate of oestradiol (oestroform "B," Progynon "B"); (5) Emmenin—a placental extract containing oestriol in a combined form (Ayerst).

Considerable confusion exists regarding the effective dose of these substances, owing to a variation in their potency. It should be properly understood that a biological effect produced by any one of them and represented in biological units is the same. That is, a 100 biological unit effect produced in an animal is the same whether produced by action of oestrone, oestriol, oestradiol, benzoate of oestradiol, or emmenin. There is a marked difference, however, in the quantity of each substance necessary to produce this 100 unit effect.

In the experimental animal oestrone is more effective when administered hypodermically than is oestriol. Oestrone is considered to be the parent substance and its potency has been arbitrarily given the value of 10,000 international units per mg.*

Oestradiol has a greater potency, but has not been prepared for clinical use. The variation in potency between one mg. of oestrone and one mg. of the benzoate of oestradiol is not so great, but it has been claimed that the physiological effect of the benzoate of oestradiol is more prolonged. It has been observed in the experimental animal that excretion of the benzoate of oestradiol is more protracted and that oestrus effect is more prolonged (Butenandt). Consequently, this substance is given a higher rating that oestrone in biological units for the same weight of substance. The difference in

*It should be clearly understood that this arbitrary international unit is based solely on a definite weight of fine crystalline oestrone. There is no definite relationship between the international unit and the biological unit, since the latter may vary greatly according to the method of assay. It is proposed to adopt a second international unit in the very near future for benzoylated hormone preparations, based on a definite weight of oestradiol benzoate. This second international unit again will have no definite relationship to the biological unit as determined by animal tests. It should, further, be clearly understood that no biological equivalance of the two international units will be implied.

the physiological effect of oestrogenic compounds in the human being is difficult to determine with any degree of accuracy. Emmenin is claimed to be active by mouth, and therefore cannot well be compared with the other substances which produce their optimum effect when administered hypodermically. Oestrone and oestriol and the benzoate of oestradiol are produced in the pure crystalline state and are prepared in solution for hypodermic administration. There are also preparations of these crystalline substances which are recommended for administration by mouth.

The indications for the administration of any one of the oestrogenic compounds are by no means well defined. The action of oestrin in the human being is concerned chiefly with the cyclic change in the reproductive passages during the menstrual cycle, and with certain changes in growth processes before and after puberty which are continuous over a long period of time. In the first instance there are evidences of a cyclic rise and fall in oestrin concentration in the body with no apparent effort to store the hormones. In the second instance there is evidence of a fairly continuous concentration of oestrin in the body to favour growth processes which are continuous. It becomes apparent, then, that in the absence of any oestrin production in the body a huge dose at long intervals will not supplant smaller daily doses, and for satisfactory effects a fairly continuous concentration must be maintained. Large doses of oestrin represented in international units by a range between 10,000 and 100,000, and in weight of crystalline substance by doses of over one mg. may be considered to have an inhibiting effect on the anterior pituitary. Theoretically, this results in a decrease in the production of gonadotropin, and so an enforced rest in the ovarian activity as well as an increase in stimulation of the reproductive passages by a direct effect on those structures.

Therefore in our work an effort is made to increase the continuous concentration by administration of substances reputed to be active by mouth in all cases in which deficient production of oestrin is suspected. [The author proceeds to discuss the results achieved following the administration of these substances in menstrual disorders.]

Progesterone

Progesterone is now available in a pure crystalline form, and it is active in the human being when administered hypodermically. It has already been pointed out that the action of progesterone is to produce the differentiative phase in the endometrium preparatory to the normal nidation of the fertilised ovum. Reynolds and others have observed that it inhibits uterine contractions in the uteri of experimental animals, a finding which also appears to be concerned with the retention and embedding of the fertilised ovum. Engle *et al.* have observed that the administration of progesterone to female monkeys will delay uterine bleeding as long as the treatment is continued. From these conclusions, progesterone appears to have two fields of usefulness as a therapeutic agent. First, if progesterone will consistently inhibit uterine contractions in the human uterus it should be useful in relieving dysmenorrhoea. Secondly, if it shows a constant activity in delaying the menstrual flow, it should be of value in the treatment of the conditions which cause short intermenstrual intervals. The difficulty is in regulating the dose so that the contractions will be inhibited without upsetting a normal cycle. From my experience it is very obvious that further clinical investigation on the problem of progesterone action is necessary before any general statements can be made in this regard.

The Anterior-Pituitary-Like Substance (A.P.L.)

A.P.L. is regarded as a very potent ovary-stimulating substance in the intact laboratory animal. This action has not been observed in the hypophysectomised animal in an obvious degree. Neither is there conclusive evidence to show that it stimulates ovarian activity in the human being. It is excreted in the urine soon after the ovum is fertilised, and it reaches its maximum concentration about the second or third month of pregnancy. The chemical nature of this substance is unknown. A.P.L. has been administered with the hope of preventing habitual abortion. It is very doubtful that a small dose given hypodermically would prevent such a major catastrophe when large amounts are being continuously excreted.

Campbell, Henderson and others have reported favourable results in the treatment of functional uterine haemorrhage from the administration of A.P.L. These workers have made it clear that an accurate diagnosis is essential before any form of treatment is instituted for the relief of functional uterine bleeding.

Summary

The discovery of oestrone, oestriol, and progesterone, in pure crystalline forms, and the isolation of the ovary-stimulating hormone gonadotropin from the anterior-pituitary gland have simplified our understanding of the physiology of the reproductive organs. In this discussion an effort has been made to acquaint the reader with the principles which govern the normal function of the reproductive system. The relation between the anterior pituitary and the ovaries in the human being, as outlined, is a theoretical one based upon the results of investigations carried out on the experimental animal by workers in this field. The action of

oestrin and progesterone on the endometrium as described is supported by observations made during clinical studies in our own clinic and by reports in the literature from other centres.

It is not possible to generalise regarding the indications for the use of the sex hormones as therapeutic agents. Every patient presenting symptoms of abnormal function in the reproductive system must have her symptoms thoroughly investigated and they must be treated individually. These patients must be trained to submit themselves to a thorough investigation and to assist the clinician by keeping thoroughly accurate records of their symptoms over a long period of time.

Acute excessive haemorrhage and malignant tumours are the only conditions in the reproductive tract which demand the institution of immediate surgical X-ray or radium treatment. Therefore verbal statements concerning the existence of menstrual pain, irregularity, or excessive uterine bleeding should not be accepted as a basis for a heroic form of therapy. Otherwise cures will frequently be effected where maladies did not exist.

Sex hormone therapy is useless and contraindicated if the patient is not well nourished and in good general health. Active preparations of oestrogenic substances are frequently discredited by the fact that they have been administered to patients suffering from malnutrition or anaemia.

In view of the fact that a continuous low dosage of oestrogenic substance is desirable in most of the clinical conditions encountered, *i.e.*, underdevelopment of the reproductive tract, dysmenorrhoea, the symptoms of the late menopause, and some cases of sterility, a preparation which shows oestrogenic activity when administered orally is highly desirable. Preparations of the crystalline substances oestrone, oestriol, or the benzoate of oestradiol, having a known potency of 10,000 to 100,000 units when administered hypodermically, are valuable in the treatment of certain types of amenorrhoea and some atrophic conditions in the reproductive tract. It is my opinion that repeated doses of the oestrogenic compounds having a known potency of 100,000 units, large doses of progesterone or of gonadotropin, should not be recommended for treatment of conditions during the reproductive period without some qualification.

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Clinical Communication

A CASE OF POISONING BY KEROSENE

I. FUNDAMINSKY, M.R.C.V.S.

S.P.C.A. Animal Hospital, Jerusalem, Palestine

Subject.—A four-year-old fox-hound bitch.

History.—The hound was suddenly taken ill with convulsions without there being an apparent cause. The man in charge of the hound thought the convulsions to be due to intestinal worms.

Symptoms.—When seen half an hour after the onset of illness the animal was lying in a very depressed state; there was intense dyspnoea with convulsive movements of the limbs. Before any treatment could be applied the patient died while passing a small quantity of blood from the nostrils. There was no vomiting.

Post-mortem.—A *post-mortem* examination was made and the findings were as follows: The subcutaneous connective tissue was hæmorrhagic. On opening the stomach one was struck by the smell of paraffin oil exuding from the stomach contents. The mucous membrane of the stomach and intestines was inflamed. The liver, spleen, kidneys and lungs showed very intensive and widespread hæmorrhages. The trachea, bronchi and bronchioles contained bright red fluid. There was very little air in the lungs and they sunk in water.

Material was sent for analysis. Forty grammes of kerosene (crude paraffin oil) were found in the stomach and duodenum. The analyst concludes that the presence of this quantity of kerosene would account for the death of the dog. He also remarks that "in five reported cases of human poisoning by consumption of kerosene there is no mention of vomiting and in one of the cases it is expressly stated that there was no vomiting."

The immediate cause of death was probably asphyxia, associated with convulsions, which was caused by pulmonary hæmorrhages, the latter being the effect of the poison.

No evidence could be traced to show how the poisoning occurred, although the kerosene is believed to have been administered maliciously.

It should be noted that kerosene is very widely used in Palestine as fuel and a stock of several gallons is always kept in every house.

Anthrax is prevalent in many parts of the world from which supplies of raw hides, hair, wool and cattle cake are drawn, says the Liverpool Medical Officer of Health in his annual report. He suggests that products of animal origin should not be mixed with or placed on top of grain or feeding stuffs while in the holds of steamers.

Abstracts

[The Influence of Pilocarpine, Arecoline and Alcohol on the Gastric Secretion of the Horse. Gurewitsch, D. I., Egoroff, S. W., Poltyreff, S. S., and Tscheredkoff, W. N. (1936.) *Arch. wiss. prakt. Tierheilk.* **70.** 3. 243-250. (2 tables, 1 fig.)]

The authors used for their experiments a thirteen-year-old draught mare which had been immunised with organisms obtained from its caecum and which was then operated upon in order to establish a permanent gastric fistula. The gastric secretion was collected by means of a rubber tube inserted into the fistula. Food was withheld for 24 to 48 hours before each experiment. The administration of alcohol either subcutaneously or directly into the stomach was in no case followed by an increase in the amount of gastric juice secreted. The subcutaneous injection of 2 c.c. of 1 per cent. arecoline solution was followed in about ten minutes by a copious secretion of gastric juice which continued for about 50 minutes. Small subcutaneous doses of pilocarpine, 4 c.c. of a 0·5 per cent. solution, likewise increased the gastric secretion. In both cases, however, the juice secreted contained little pepsin. The subcutaneous injection of 5 c.c. of 1 per cent. atropine solution was quickly followed by a reduction in the amount of gastric juice secreted, the secretion eventually being brought to a standstill. J. A. N.

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[The Value of the Eye-Reflex in Animals Submitted to the so-called Electrical Stunning. Roos, J., and Koopmans, S. (1936.) *Vet. J.* **92.** 4. 127-137. (6 figs., 3 refs.)]

It has been presumed that the abolition of the eye-reflex which occurs when an electric current is applied to the head of an animal indicates that consciousness has been lost. The authors, however, have shown that this is not necessarily the case since when the circuit is closed the muscles of the eyelids are brought into tonic spasms and are not free to shut when the conjunctiva or cornea is touched. They found that stimulation of the cervical sympathetic nerves of cats which had recovered from the narcosis necessary for the operation of implanting the electrodes, produced dilation of the pupils, opening of the eyelids and retraction of the membrana nictitans. During the passage of the current, the corneal reflex was either completely abolished or greatly modified. On direct stimulation of the eyelid muscle, it was found that these closed at first but opened to normal width later: even at this stage, however, the corneal reflex was absent. The authors conclude that when an electric current is used in order to stun animals before slaughter, the

condition of the central nervous system cannot be judged by the presence or absence of the corneal reflex. J. A. N.

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[The Footner Electric Collar for the Humane Slaughter of Animals. Amos, S. T. (1936.) *Vet. J.* **92.** 3. 82-84.]

An apparatus designed by W. E. Footner, M.R.C.V.S., and E. R. Wadsworth, A.M.I. MECH. E., for the electrical stunning of animals prior to slaughter has been used in Durban on 70,000 oxen with marked success.

It is portable and consists of a collar (which is applied in, or near to, the upper extremity of the jugular furrow), a transformer and other accessories. The current is 160 volts A.C. and is automatically switched off after 30 seconds application. The animal receives a preliminary cold water shower on the neck and the collar is slipped on from behind.

It is claimed that the human element is entirely eliminated, that failure is impossible, that the animal remains unexcited throughout the operation, that bleeding is more complete than by any other method and that death will ensue, after the application of the electric current, in every case without any other operation. H. E. B.

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[Pullorum Disease in Turkeys. Johnson, E. P., and Anderson, G. W. (1936.) *J. Inf. Dis.* **58.** 3. 337.]

Details are given concerning losses among turkey poults on two farms. Poults began to die at three days of age and continued until the twelfth day, the losses on one farm approximating 100 per cent. and on the other 33 per cent. *S. pullorum* was isolated from poults and also from the internal organs of a female turkey on each farm. A positive titre of 1 : 400 was given by these adult females when subjected to the blood agglutination test. The authors point out that numerous samples of turkey sera give a positive titre of 1 : 25 without any history of loss or other manifestations of pullorum disease and suggest that a titre above 1 : 50 would be necessary to locate turkeys harbouring *S. pullorum*. D. W. M.

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[The Dermotropic Viruses of Animals. Immunological Relationship of Viruses of the Variola Vaccine Group.* Glover, R. E.]

Recent experiments by Nelson have shown that sows inoculated with vaccinia prior to farrowing transmit protective substances to their offspring by way of the colostrum. In the contagious pustular dermatitis of the sheep, which is regarded as closely allied to the variola-vaccinia group, a dermal eruption induces a very solid immunity; moreover, the blood serum contains protective antibodies. Nevertheless, lambs born of ewes vaccinated during pregnancy are almost fully susceptible to the disease, *i.e.*, there is no transference of immunity either by the placenta or the colostrum.

The most satisfactory method of determining the relationship of the various members of the variola-vaccinia viruses is by cross-immunity tests. They may be conveniently divided into two groups. The first comprises the true variola of man, the sheep, the pig and the fowl, which are generally regarded as entirely separate entities. They are strongly species specific and immunologically distinct from one another. The second consists of vaccinia only, which is capable of affecting most species either naturally, as is the case in the horse, cattle and pig, or artificially, as in the sheep, goat and fowl.

There is still a third group, *viz.*, the infectious dermatitis of the sheep and that of the goat. These conditions, although they are immunologically distinct from vaccinia and variola, yet are clinically similar to these diseases and produce experimental lesions which closely resemble those of vaccinia. In the sheep, dermatitis can be definitely differentiated from sheep-pox, but a clear distinction between dermatitis of the goat and goat-pox has yet to be furnished.

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[Immunological Observations on Experimental Influenza.* Wilson Smith.]

Influenza in the ferret results in a condition of complete resistance against reinfection lasting for a few months. Thereafter the immunity slowly wanes, but some virus-neutralising antibodies remain in the circulation long after the animal has again become susceptible. Vaccination, during the period of waning immunity, results in a sudden increase of circulating antibodies and a return to the state of complete resistance. Similar vaccination of normal ferrets induces antibody formation and some degree of resistance against the experimental disease, but fails to immunise completely.

Mice can be completely immunised by vaccination but success depends upon factors not, as yet, completely under control. The mass of virus injected, the number of immunising doses and the time intervals between doses are most important. If an adequate quantity of virus is given it makes little difference whether it be living or killed with formalin. A very important factor is the animal species from which the virus is obtained. Thus mouse virus has proved a much better immunising agent for mice than has ferret virus.

Mice may also be passively protected against infection by relatively large doses of immune horse serum. The serum exerts a beneficial

*Abstracts of communications made to the Second International Congress for Microbiology, London, July 25th-August 1st, 1936.

effect even when given as late as 72 hours after infection.

In man, the little evidence there is at present available suggests that circulating antibodies are of great importance. Attempts to infect two human volunteers with ferret virus failed but both cases had neutralising antibodies in the blood stream at the time of test. Three cases are known in which the disease was probably contracted from experimental ferrets. In one of these the antibody response was studied. Before infection no detectable antibodies were present but following infection there was a gradual rise of antibodies until they attained a high titre.

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[Types of Immunity to Swine Influenza.* Shope, R. E.]

The types of immunity to swine influenza, a disease caused by the concerted action of a filterable virus and the bacterium, *Haemophilus influenzae suis*, have been studied. Swine inoculated intramuscularly with a heat-killed vaccine of *H. influenzae suis* acquire a partial immunity to swine influenza and, when later given their intranasal test with virus and bacterium, exhibit a mild illness resembling that caused by the virus alone. Swine inoculated intramuscularly with the swine influenza virus are actively immunised to swine influenza and their sera contain specific virus-neutralising antibodies. Swine inoculated intranasally with human influenza virus also become immune to swine influenza but develop no neutralising antibodies for the swine influenza virus. Ferrets and mice, to which swine influenza virus derived from swine lung is administered subcutaneously, develop neutralising antibodies for the virus but remain susceptible to intranasal infection. Ferrets and mice to which the prophylactic inoculations of swine influenza virus are given intraperitoneally develop both neutralising antibodies and an active immunity to intranasal infection with the virus. The character of the immunity in ferrets and mice is further influenced by the animal source from which the virus used as vaccine is derived. There would thus appear to be at least three types of immune reaction to the swine influenza virus; active immunity accompanied by specific virus-neutralising humoral antibodies, active immunity without demonstrable antibodies, and antibodies without active immunity.

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[Notes on the Reaction of Tissues to Infection with Virus Agents.* Tulloch, W. J.]

If we accept the virus agents as subvisible microbes, then we should expect that tissue response to invasion by them will not differ fundamentally from that called forth by bacterial infection.

The formation of new tissue akin to granuloma, which may in some instances resemble true neoplasm, is frequently a feature of infection with virus agents. On the other hand, among these agents there is none which is frankly pyogenic, although activity on the part of phagocytes has been observed in vaccinia.

As to humoral response, an overwhelming weight of evidence has accumulated to show that the virus agents act as antigens. Therefore antibodies exhibiting specific protective, complement-fixing and precipitating properties are called forth in animals immunised against these agents. However, little is to be expected from the employment of antiserum in therapeutics of virus diseases because of the peculiar invasive quality of the causal agents.

In contrast, the diagnostic value of such sera in serological tests may be considerable.

Owing to the difficulty of cultivating the agents, such tests should be designed to demonstrate the presence of virus in morbid material rather than the presence of antibodies in serum. This latter method does not show that infection exists, but merely that it has existed at some time. When conducting such tests one should remember that the antigen is in a finely particulate state, because the precise technique most suitable for showing the formation of any "antibody-antigen complex" is conditioned by the degree of particulation of the reagents.

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[The Classification of the Brucella Group on Antigenic Structure and Metabolic Characteristics.* Wilson, G. S.]

The use of the absorption of agglutinins test in its original form does not enable a distinction to be drawn between the three chief members of the Brucella group—*Br. melitensis*, *Br. abortus*, and *Br. suis*. Each organism is able to absorb the agglutinins completely from a serum prepared against either of the other organisms. If, however, a small absorbing dose is used, and is adjusted to the titre of the serum to be absorbed, it is possible to distinguish between *Br. melitensis* on the one hand, and *Br. abortus* and *Br. suis* on the other. Examination of large numbers of strains by this quantitative absorption test has rendered it probable that all three organisms contain qualitatively the same antigens though distributed in different proportions. In the quantitative absorption test the aim is to absorb out the minor agglutinins and leave most of the major agglutinins intact. Such an absorbed serum is practically monospecific and can be used for the rapid differentiation of the two main serological types of Brucella. An exception to this general rule is furnished by certain strains from the South-East of France. Some of these strains react serologically like *Br. abortus*, yet are classified by the dye and H_2S tests as *Br. melitensis*, while others, which

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Report

REPORT OF THE DEVELOPMENT COMMISSIONERS*

The functions of the Commissioners are to examine all applications for grants from the Development Fund which are addressed to the Treasury; to veto expenditure on schemes which they consider unsuitable; to amend, usually in consultation with the applicant bodies, such schemes as may, when amended, appear to promise useful results and to recommend advances from the fund, by way of grant or loan, of the sums likely to be required to give effect to the schemes which they approve. The majority of the schemes aided from the fund call for recurrent expenditure and advances for them are recommended annually. The total of the advances recommended in 1934-35 and subsequently approved was £490,968 as compared with £343,636 in 1933-34 and £416,959 in 1932-33. For 1934-35 the sum was distributed as follows:—

Agriculture and rural industries	£402,859
Fisheries and harbours	£88,109

The report is divided into several sections.

Introduction.—This gives brief details of the Land Settlement Association, allotment schemes and casual employment in agriculture, fisheries and fishery harbours. The opinion is expressed that the land of this country could provide a living for a larger number than the 7 per cent. of the population now employed upon it, and the Commissioners recommend strongly the work upon which the Land Settlement Association is engaged. Grants were also made in aid of the Scheme for providing allotments for the unemployed, initiated by the Society of Friends and supervised by them in England and Wales and by a joint committee in Scotland.

Agriculture and Rural Economy.—A considerable portion of this section is taken up with details of research institutes and experimental stations. The incomes of research institutes are derived from a number of sources but in all cases the maintenance grant from the Development Fund is much the largest source. Provision for their maintenance is made in advance and the amount of grants sanctioned for each institute, the organisation of the work, and the numbers of staff employed are recorded. Nearly 30 such institutes are mentioned, the research work covering a large field and embracing such subjects as: soil science, plant physiology, plant breeding, plant viruses, agricultural botany, animal nutrition, animal breeding, animal pathology, agricultural parasitology, dairying, poultry research, agricultural engineering and agricultural economics.

Nearly all the research institutes take some part in advisory work, but the contact between the research worker and farmer is increased by the employment of some 140 specialists at various centres. These specialists are employed in conducting local investigations and in providing advice for farmers in counties grouped round the centres; their objective is local rather than general and is conditioned by the fact that advice for a particular group of agriculturists, rather than the preparation of a scientific paper for publication, is the immediate task in hand. The advisory staffs now employed consist of chemists, entomologists, mycologists, veterinary investigation officers, and economists. The grants sanctioned in 1934-35 for various branches of work at advisory centres total £75,140 in England and Wales and £11,353 in Scotland compared with £71,490 and £10,782 respectively for the previous academic year.

A central body—the Rural Industries Bureau—guides the general policy of rural industries' development throughout the country, and supplies expert advice on craftsmen's problems referred to it by the Rural Community Councils. Grants are made both to the various councils and to the central body. The former are intended to assist in meeting the salary and expenses of a rural industries organiser, where one is employed, and the cost of exhibitions and publicity; they also include a contribution towards the general administrative expenses of a council. Grants were also made to agricultural organisation societies, the total grants sanctioned for rural industries being £20,343 for the year under review.

Fisheries.—The Commissioners recommended in all the sum of £37,299 for the maintenance of fishery research during the year 1934-35. All applications for grants in aid of this research were referred to the Advisory Committee under the Chairmanship of Professor E. W. MacBride, F.R.S. The Advisory Committee recommended that for administrative convenience two divisions of the field of fishery research should be recognised in the allocation of grants, though the dividing line between them was deliberately left indefinite. The Commissioners accepted this recommendation and grants are made for:—

(1) "Directed" research, with the object of solving selected problems of immediate importance to the fishing industry.

*Twenty-fifth Report, being for the year ended March 31st, 1935. H.M. Stationery Office. 2s. 6d. 141 pages.

react serologically like *Br. melitensis*, have the metabolic characteristics of *Br. abortus*. The virulence and general epidemiological behaviour of these abnormal strains appears to be indicated better by metabolic than by serological tests. The relation between antigenic structure, roughness and smoothness, and metabolic activity is discussed.

(2) "Free" research, where the aim is to build up basal knowledge upon which a successful attack on the problems of the industry can be founded.

Under "directed" research, brief particulars are given concerning the investigations of the actual sea fisheries, such as the "racial" characteristics of the herring caught throughout the year in Scottish waters. "Free" research is carried out generally in laboratories and marine stations attached to various colleges and universities, and reports on work in progress are given. Whereas in the agricultural section of the report, administrative subjects alone are dealt with, in the fisheries section an account of the work which comes under review of the Advisory Committee is included. A sum of £47,473 is given as the total grant made to fisheries, and grants were also sanctioned towards the construction and improvements of harbours.

There is a complete schedule of the advances recommended by the Commissioners at the end of the Report. R. L.

Review

[**The Chemistry of Milk.** Davies, W. L. Chapman & Hall, Ltd., London, 1936. Price 25s.]

No fluid, except perhaps water, has been of greater importance to man than milk, yet our knowledge of its chemical make-up has been gained mainly during the last two centuries. Nevertheless that knowledge remains incomplete and much original work continues upon such constituents as the inorganic substances, the proteins, the enzymes and those many so-called "minor constituents" such as the vitamins, etc., which compounds seem to be of such major importance in adequate nutrition. A great deal of this recent work should be known by all professional men associated in any way with the milk industry, but up till now no handy review of the subject matter has been presented. This serious omission has now been rectified by Messrs. Chapman and Hall, who have recently added to their series of monographs on applied chemistry this review by Dr. Davies of the National Institute for Research in Dairying.

From the fact that this volume forms one of this series on applied chemistry, the veterinarian might be pardoned for concluding that its subject matter would be of little interest or use to him. Such a deduction proves to be quite false, for although the book is concerned with the chemical entities which go to make up milk yet the text is almost devoid of the detailed description of methods which proves to be so boring to the non-chemist. The first part is devoted to a discussion of the composition of milk and the various factors which may influence it. The three chapters contain much that a farmer might with justice expect his veterinarian to know; he would, in fact, feel distressed if his expectation should prove incorrect. Parts two and three give a detailed description of the chemical and physical chemical nature of the constituents of milk, and although they include much that the average veterinarian need not remember, yet he would gain much interest and profit from their perusal. So with part four, which deals with milk processing, this knowledge is not essential to the veterinarian but it is full of facts which cannot help but give him a greater appreciation of the milk industry and will help him to appraise more properly the description of the nutritive value of milk given in part five. This chapter is an excellent review of the knowledge on this subject of obvious value to the veterinarian.

After reading the book, the reviewer can do nothing else but praise it to the reader of the *Veterinary Record*, for its style is generally so clear that even the more chemical portions are comparatively easy to follow. As a small reference volume on the subject the book can undoubtedly be recommended to the veterinarian whether he be engaged in practice or in the public health service, while its many references at the end of each chapter will direct the more advanced student to the appropriate original papers. Altogether the author of this volume is to be congratulated upon producing a most readable, up-to-date and reasonably complete review of the chemistry of milk: it can be strongly recommended to the veterinary profession.

MAN'S RELATION TO THE APES

"Dr. Robert Broom, of the Transvaal Museum, and his colleagues have made in the Sterkfontein caves near Krugersdorp a discovery of great importance for the study of prehistoric man," states the Johannesburg correspondent of the *Times*. "They have found the natural cast in limestone of the brain of a very advanced type of ape and a number of fossilised bones of the skull to which the brain belonged, including parts of the jaws and a number of teeth.

"A detailed examination has yet to be made, but it seems fairly well established that the skull was of a creature of the same type as the Taungs ape discovered in 1924. The discovery is regarded as of particular importance, because the Taungs skull was that of a six-year-old ape, whereas the Sterkfontein skull is that of an adult. With both skulls for comparison more reliable inferences will now be possible about the relation of these African super-apes to existing anthropoids on the one hand and to fossil and living types of man on the other. Dr. Broom has held to the view that in these South African types an advance towards human standards will be found. Hence his great interest in the Sterkfontein discovery and his faith that very important evidence of the course of evolution towards humanity will be found in this country."

N.V.M.A. Divisional Reports

MID-WEST V.M.A.*

SUMMER MEETING AT STROUD

The Summer Meeting of the Mid-West Division was held at Stroud on Friday, July 17th, by kind invitation of Mr. Margarson.

The following members were present: Mr. C. R. Golledge (President), Messrs. C. S. Adams, J. J. Aveston, J. R. Barker, T. J. Brain, E. C. Bovett, J. C. Coleman, W. Downing, F. J. Eardley, S. V. Golledge, J. Howard Jones, T. J. Margarson, A. E. Roberts, G. H. Thomas, W. Tweed and W. R. Watson. Messrs. J. McGhee, Ibrahim Mahmoud, L. T. Morris and W. J. Barclay Watson attended as visitors.

Apologies for absence were received from Sir Frederick Hobday, Messrs. McDowell, Hewer, Henson and Dr. Scott.

New Member.—Mr. Forker, Divisional Inspector for the Ministry of Agriculture, Bristol (proposed by the President and seconded by Mr. Watson), was unanimously elected to membership of the Division.

The Late Professor Macqueen.—The President expressed regret for the loss sustained by the profession in the death of Professor Macqueen, who, said the President, had been one of the pillars of the profession. He was supported by the Hon. Secretary, who reminded the members that some ten years ago, Professor Macqueen had presented a paper to the Division at Bath on "Examination for Soundness"—he well remembered that that was one of the best meetings ever held by the Society. The members, at the request of the President, stood in silence as a tribute of respect.

The President then proposed that two guineas should be sent to the Victoria Benevolent Fund for the Macqueen Memorial Fund. This was seconded and carried.

Paper.—Mr. W. Downing, F.R.C.V.S., of the Cooper Technical Bureau, then gave his paper on "The Life-History of the Scab Mite in Relation to Control Measures," and the following members took part in the discussion: Messrs. C. R. Golledge, J. R. Barker, S. V. Golledge, Tweed and Adams. Mr. Downing suitably replied. [This paper is reproduced at the commencement of this issue of the *Veterinary Record.—Editor.*]

A vote of thanks to Mr. Downing for his paper was proposed by the President and seconded by the Secretary, the President saying how very kind it was of Mr. Downing to come and give his paper, which was really a lecture, and that he was quite sure that everyone had learned something from it.

Morbid Specimen.—Mr. Bovett showed a tumour on the liver, weighing two-and-a-half pounds, taken from a small bitch. The tumour had been examined by Professor Davie, who pronounced it to be an angiosarcoma.

Exhibits.—Mr. Tweed exhibited a marking machine suitable for marking cattle under the Accredited Herd System; also an intradermal syringe, of the dental type, for tuberculin testing.

Demonstration of X-ray Apparatus.—Mr. J. Barker, of Messrs. Watson and Sons (Electro-Medical) Ltd., manufacturers of X-ray and electro-medical appliances, of Sunic House, Parker Street, Kingsway, London, W.C.2, demonstrated a Sunic-junior X-ray apparatus, suitable for veterinary use.

Later, the ladies and members met at the Bear Hotel, Rodborough Common, where a Severn salmon tea was provided at the invitation of the President. The following ladies were present: The Misses Watson and Roberts, Mesdames Golledge, Howard-Jones, Watson, Roberts, Downing, Perry, Margarson and friend. They had very much enjoyed a charabanc tour over the Cotswold Hills under the guidance of Mrs. Margarson.

A hearty vote of thanks was proposed by Mr. Aveston to the President for his kindness and generosity in providing the tea for members and friends.

Charles E. Perry, *Hon. Secretary.*

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CENTRAL VETERINARY SOCIETY

THE WELLCOME MUSEUM VISITED

Although the Summer Meeting of the Society did not take the form of an "outing," in the strict sense of the word, it was unfortunate that more Fellows did not avail themselves of what was virtually the first fine day of that season to take advantage of the invitation kindly extended to them by the Director, Dr. S. H. Daukes, to visit the Wellcome Museum of Medical Science, for those who omitted to attend missed a most interesting and informative occasion.

The June meeting was held at 183-193, Euston Road, N.W.1, accordingly, at 6.30 p.m. on the 4th of the month, when the President (Captain J. F. Macdonald) presided, supported by the following: Messrs. R. E. C. Bullen, J. Bushman, H. E. Bywater (Hon. Secretary), W. Denington, J. W. H. Holmes, H. D. Jones, Dr. J. McCunn, Mr. H. E. Smithers, Captain R. J. Stow, Mr. J. S. Steward, Mr. C. Searles and Miss O. Uvarov. There were also present as visitors, Dr. Blum, Messrs. J. A. Baigent, H. J. Farman, J. Hickman, M. Kink, R. P. Morgan, S. Pollock, L. J. Scorgie, C. L. Sparke and Dr. Thaler.

The minutes of the last meeting, as published in the *Veterinary Record*, were taken as read

*Received for publication August 15th.

and confirmed on the proposition of Mr. H. D. Jones, seconded by Captain R. Stow.

The President then accorded a hearty welcome to Drs. Blum and Thaler, of Germany, who were present as visitors.

Apologies for absence were received from Mr. G. N. Gould, Jun., Professor Miller, Major-General Sir John Moore, Colonel Mulvey, Dr. Stableforth, Mr. R. A. Willett and Professors Wooldridge and Wright.

Elections.—The following were unanimously elected Fellows of the Society: Miss K. Morant, 24, Watling Street, Radlett, Herts. (Proposed by Mr. J. W. H. Holmes, seconded by Miss Oyler); Captain H. E. Smithers, 194, Whitchurch Lane, Edgware (Proposed by Hon. Secretary, seconded by Mr. T. J. Maguire); Major Grahame Williamson, O.B.E., Station Veterinary Hospital, Aldershot (Proposed by Major-General Sir John Moore, seconded by Major Oxspring).

Exhibit.—Mr. J. W. H. Holmes exhibited the extremity of a fore limb of a foal with a supernumerary digit, the specimen having been forwarded by Major Hicks.

Clinical Discussion.—The President mentioned the occurrence of cases of screaming from no apparent cause amongst dogs of either sex. Bitches were usually the more severely affected whilst in dogs he had noticed it occasionally associated with enlargement of the prostate glands.

Mr. Cyril King described similar cases and said he had met the condition most frequently in Chows. Treatment appeared to be futile.

Professor McCunn said the condition, which was quite common, appeared to be due to some irritation of the sympathetic nervous system. Protocaine was useful in the treatment of the condition on account of its anaesthetising effect. The administration of a five-grain aspirin tablet daily had proved almost a specific in the hands of Mr. Stainton.

The short business meeting, which was curtailed to allow time for the main object of the meeting, having been closed, the members were conducted over the Museum by the director, Dr. Daukes.

The Museum

The Museum is unique in that, as far as possible, each disease or subject is dealt with pictorially and by means of specimens or models. The models are exceptionally well executed and, in the case of insects, a natural-sized specimen is accompanied by an artistically produced enlargement, correct to the minutest detail.

Each disease is described and by means of photographs, drawings, models, pathological and zoological specimens, apparatus and statistical devices together with files, which are kept daily up to date from the current literature, a complete and graphical representation of the subject is presented in a most pleasing and easily assimilated form. Slides prepared from coloured photomicrographs are arranged in special viewing-boxes, which give a most realistic impression of the actual microscopical field. The Museum is arranged in sections dealing with the general diseases of each of the body structures, also neoplasmata, and bacterial, virus, proto- and metazoal diseases, whilst specimens illustrative of endocrine and food-deficiency diseases and the subject of dietetics are also attractively and well displayed.

The Museum is primarily designed for the medical student, but there is much which is of interest to the veterinarian and one was astounded at the rapidity and ease with which one was enabled to visualise and assimilate the salient features connected with the aetiological, pathological, therapeutical and prophylactic aspects of each subject dealt with. Perhaps the most outstanding feature was the magnificent section dealing with tropical diseases and one was left with envious longing for similar facilities for our own students to acquire with compelling ease a grasp of veterinary tropical and other diseases.

The gratitude of the members to Dr. Daukes for his kindness in introducing the Museum to us is acknowledged. It was, indeed, but an introduction—for really to look over the Museum with any sort of studied interest would take weeks, not merely an hour or so. Hence, when interest was barely stimulated, the "home-yearning" looks of the attendants caused the members to realise that time does not stand still even for the "knowledge-thirsting student" and so an evening of absorbing and stimulating interest was brought all too swiftly to a close, but not before mental resolutions were made to visit and revisit the Museum as individual opportunities would permit.

H. E. Bywater, *Hon. Secretary.*

The Scottish Animal Diseases Research Association have applied for further grants from public funds to enable them to increase their staff and begin a more intensive investigation of grass disease, which is taking heavy toll of horses in Scotland.

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Included in the programme of a sessional meeting of the Royal Sanitary Institute to be held in the Town Hall, Rhyl, on Friday, September 25th, 1936, will be a discussion on "The Incidence of Tuberculosis in Cattle-Breeding Districts," to be opened by Dr. R. F. Montgomerie, B.Sc., F.R.C.V.S., Chief Veterinary Advisory Officer, University College of North Wales. The Chair will be taken at 5 p.m. by Dr. James Fenton, Chairman of the Council of the Institute. The meeting is being held in conjunction with the Welsh Branch of the Society of Medical Officers of Health. Full information regarding the meeting can be obtained from the Secretary, Royal Sanitary Institute, 90, Buckingham Palace Road, London, S.W.1.

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Sept. 14th-18th.—N.V.M.A. Annual Congress, Scarborough.

Sept. 17th.—Annual Meeting and Dinner of the Royal (Dick) Veterinary College Alumnus Association, at Scarborough, 6.30 p.m.

Sept. 21st.—Meeting of the Editorial Committee, N.V.M.A., at 2, Verulam Buildings, Gray's Inn, W.C.1, 4 p.m.

Sept. 21st, 22nd.—Jubilee Memorial Bursary Examination.

Sept. 29th.—Meeting of the Southern Counties Division, N.V.M.A., at Aldershot, 3 p.m.

Oct. 2nd.—R.A.V.C. Old Comrades' Association, Annual Re-union Dinner, Anderton's Hotel, Fleet Street, E.C.4, 7.30 p.m.

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THE SCARBOROUGH CONGRESS

Operations and Demonstrations

We have been asked by the Hon. Local Secretary to draw the attention of our readers to the fact that a very interesting and instructive programme of operations and demonstrations has been arranged in connection with the above Congress. They will be staged at the Scarborough Corporation Stables, Dean Street, Scarborough, on Tuesday next, 15th inst., commencing at 3 p.m.

The following is a précis of the arrangements which have been made:—

I.—Demonstration of the method used in the diagnosis of the principal diseases of poultry, including avian tuberculosis, pullorum disease (B.W.D.), coccidiosis, neuro-lymphomatosis (fowl paralysis), and blackhead. These demonstrations will include the conducting of *post-mortem* examinations of fowls and photographs and specimens of disease conditions will be exhibited. The demonstrator will be Mr. K. D. Downham, B.V.Sc., M.R.C.V.S.

II.—Demonstration of euthanasia in small animals—dogs and cats—by Professor J. G. Wright, F.R.C.V.S. This demonstration will include:—

(*a*) In dogs: (1) Use of the Temple-Cox captive bolt pistol; (2) use of the "Golledge" euthanator; (3) intraperitoneal injection of nembutal; (4) intravenous injection of nembutal; (5) intravenous injection of avertin, and (6) intravenous injection of magnesium sulphate.

(*b*) In cats: (1) Intrathoracic injection of nembutal; (2) intraperitoneal injection of nembutal; (3) intravenous injection of nembutal, and (4) intravenous injection of avertin.

In connection with this demonstration Major G. W. Dunkin, M.R.C.V.S., D.V.H., has very kindly undertaken to give, prior to the demonstration, a short address on the subject of euthanasia.

III.—Demonstration of the use of epidural anaesthesia in bovines and equines, by Professor T. G. Browne, M.R.C.V.S. It is felt that, in view of the many and varied occasions on which this method of anaesthesia might be employed, this demonstration should prove very attractive to all general practitioners who attend the Congress. At the request of the demonstrator, we publish for the guidance of those attending the demonstration, as a loose insert in this issue, a selected series of illustrations from the article on this subject by Dr. G. B. Brook published in our issues May 11th to June 8th, 1935.

IV.—Several very interesting operations have also been arranged, including the following: (1) Operation on two cryptorchids, by Professor Sir Frederick Hobday; (2) operation for "hernia," by Mr. R. Hudson, F.R.C.V.S.; (3) special technique of the Burdizzo method of castration of calves and lambs, by Mr. W. W. Lang, M.R.C.V.S.

V.—Case for Diagnosis. A thoroughbred mare which shows very definite but mysterious symptoms will be exhibited during the Congress and will be available for examination by all those present. This case should evoke a very interesting discussion.

The committee are still on the look-out for any interesting cases which could be demonstrated or operated upon at the Congress, and should any such be found arrangements will be made to have them at Scarborough. It is hoped there will be a large attendance at the above operations and demonstrations, as well as at all the other functions, etc., arranged in connection with the Congress.

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R.C.V.S. OBITUARY

Power, William Henry, 66, John Street, Waterford, Irish Free State, Captain late R.A.V.C. Graduated Dublin, December 11th, 1912; died August 31st, 1936.

Captain W. H. Power, M.R.C.V.S.

The late Captain Power, whose death we announce above with much regret, was one of Waterford's most esteemed and respected citizens. He was a member of a well-known Waterford family, whose associations with the city go back for close on a century. Captain Power conducted an extensive practice throughout the entire County of Waterford, and many neighbouring counties. For close on 16 years he held positions under the Waterford Corporation as Inspector under the Diseases of Animals Acts, the Milkshops, Dairies and Cowsheds Act, and was also Inspector of Meatshops and Public Slaughterhouses, in all of which appointments he proved himself to be most able and efficient in the discharge of his duties. In these capacities

he succeeded the late Mr. Arthur Dobbyn, who died about the year 1920.

The late Captain Power was eldest son of the late Mr. David Power and Mrs. Power, of John Street. At the outbreak of the Great War he joined the British Army and was amongst the first 100,000 to be ordered on active service. He was then attached to the Ninth (Scottish) Division, R.F.A., and saw service throughout the duration of war in France, and later was one of the Army of Occupation beyond the Rhine. He was demobilised in 1919 with the rank of Captain. For some months past Captain Power had been in indifferent health. He is survived by his widow, Mrs. Julia Garvey Power, to whom, and to the other members of his family, sincere sympathy is extended in their bereavement.

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GENERAL OBITUARY

Milligan.—At 5, Ednam Street, Annan, on August 28th, Sara E. Hayes, wife of Alfred J. Milligan, M.R.C.V.S.

Lord Moynihan

Lord Moynihan, who died at his home in Leeds on Monday last in his seventy-first year, and shortly after the death of his wife, was one of the most eminent British surgeons and, with the exception of Lord Lister, the only one to be created a peer. The first provincial surgeon to be elected President of the Royal College of Surgeons, his name will be associated with two outstanding achievements; the first, the transformation of abdominal surgery from a hazardous, last-resort interference to a relatively safe and readily-undertaken procedure; the second, the removal of hindrances to surgery represented by the want of a leader in experimental surgery and a lack of opportunity for the surgeon to obtain first-hand knowledge of the work of his colleagues either at home or abroad. Moynihan took the lead in founding the *British Journal of Surgery*, brought surgeons together into a club, the members of which travelled widely, and obtained funds to endow research scholarships and to provide accommodation where original work could be undertaken. It was entirely due to his energy and ability that the Cancer Research Fund opened so well, while another of his professional interests was support of the movement for the adoption of euthanasia for the human "incurable sufferer."

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PERSONAL

Birth.—On September 2nd, to Beryl, wife of C. Trevena Bray, M.R.C.V.S., 162, Battersea Bridge Road, S.W.11, a son.

Dr. C. J. Reakes: A Correction.—Dr. C. S. M. Hopkirk, Officer-in-Charge, Veterinary Laboratory Livestock Division, Department of Agriculture, New Zealand, writes: "With reference to the personal history which you published recently (48. 20. 649) of Dr. C. J. Reakes who recently retired from the New Zealand Government Service, there is one small correction which, for the sake of accuracy, requires to be made. It is stated that there were three veterinary surgeons in the Government Service when Dr. Reakes joined. My friend, Dr. J. A. Gilruth, says, and I find it also borne out in records, that Mr. Charlton had resigned from the Government Service two years previously and was in private practice in Christchurch. In case a history of the veterinary profession in New Zealand ever happens to be written I think it advisable that the correction be made."

On Leave.—The following veterinary officers in the Colonial Service arrived home on leave during the month of August: Captain W. S. Aitken (Uganda), Mr. E. Beaumont (Kenya) and Captain S. H. Whitworth (Federated Malay States).

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FOOT-AND-MOUTH DISEASE IN SUSSEX

The existence of foot-and-mouth disease was confirmed on Monday last among cattle at Nuthurst, Horsham, West Sussex. The area subject to restrictions in the movement of animals lies in the counties of East and West Sussex and Surrey.

The disease was suspected in six animals at a farm at Nuthurst, and the Horsham police took steps for disinfection and isolation, and notified the Ministry of Agriculture. The farm is in the Crawley and Horsham Hunt.

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ROYAL COLLEGE OF VETERINARY SURGEONS

Central Library for Animal Diseases

Following is a list of some of the volumes and other publications recently acquired by the Central Library for Animal Diseases, Royal College of Veterinary Surgeons:—

Bradley, O. Charnock.—"Topographical Anatomy of the Dog." Third ed., 1935.

Bullock, F.—"Handbook for Veterinary Surgeons." Third ed., 1936.

Gray, Henry.—"Diseases of Cage and Aviary Birds." 1936.

Spooner, W. C.—"A Treatise on the Influenza of Horses." 1837.

Machattie, C.—"A Preliminary Note on the Life-history of *Schistosoma Turkestanicum* Skrjabin, 1913." 1936.

Medical Research Council.—"Vitamins: A Survey of Present Knowledge." (Spec. Rept. No. 167) 1932.

Twort, F. W.—"Further Investigations on the Nature of Ultra-microscopic Viruses and their Cultivation."

Several papers, to be read at the forthcoming Annual Congress of the National Veterinary Medical Association at Scarborough.

National Veterinary Medical Association.—Annual Congress at Scarborough, 1936 (Annual Report and balance-sheet—Programme of Congress—List of Members, etc.).

Conference of Governors of British East African Territories—Research conferences (Conference on Co-ordination of Veterinary Research, 1936).

New South Wales Department of Agriculture—Livestock Diseases Report for 1934-1935.

Ontario Veterinary College.—Calendar, Session 1936-1937.

Imperial Agricultural Bureaux.—Sixth Annual Report of the Executive Council, 1934-1935.

Ministry of Agriculture.—Reports on the Work of the Agricultural Research Institutes, and on Certain Other Agricultural Investigations in the United Kingdom, for 1933-1934.

Hannah Dairy Research Institute.—Report for the year ending March 31st, 1936.

Imperial Council for Agricultural Research.—Review of Agricultural Operations in India, 1931-32 and 1932-33.

National Association for the Prevention of Tuberculosis.—Thirty-seventh Annual Report for 1935.

A catalogue of the books in the Library published since 1900 is now on sale, price 1s. post free.

Remittance to be sent with order to the Secretary, R.C.V.S., 10, Red Lion Square, London, W.C.1.

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LEGAL NOTES

Overloading.—At the Marylebone Police Court recently Stanley White, 20, a cartage contractor, of Bride Street, Islington, was charged with cruelty to a horse by overloading it with 800 bricks, weighing 35 cwt., and with assaulting Mrs. Conti, of Devonshire Street, W.

Mrs. Conti said, in evidence, that the previous afternoon she was leaving her house with her husband when she saw the "poor horse trying to drag a very heavy load of bricks." She said to the man: "That is a heavy load; can't you pull in and give the horse a breather?" He was dragging the horse's mouth and hitting the animal with the loose end of the reins, and it was very heartbreaking to see the horse trying to pull the load. They followed him. At the Baker Street crossing she told him that she was going to get a policeman. The driver then got off his seat and threatened her husband. As her husband was 60, and had just returned from Droitwich after taking a cure, she got between them. The driver then put his hand against her chest and threatened her. Her husband fetched a policeman, and it was found that the horse could not move the load from the stationary position without three men twisting the wheels.

A veterinary surgeon, giving evidence, said that the horse was aged and weak and at present unfit for any work. It required long rest and treatment.

The accused said, in evidence, that he did not know much about horses, but the horse showed no signs of distress and was not "blowing" when he was stopped.

The Magistrate (Mr. McKenna) said he thought the cruelty was due to complete absence of imagination or experience of horses. He fined the accused £5, with 15s. costs, on the cruelty charge, and 7s. 6d. for the assault on Mrs. Conti.

Tuberculosis: Failure to Notify.—Giving evidence in a case recently heard at Chelmsford Borough Court, when the defendants, Arthur Handley and Harold Sanders—a Cambridge smallholder and a dealer respectively—were charged with contravention of the Tuberculosis Order, Mr. A. M. Sheppard, M.R.C.V.S., assistant veterinary inspector for the County of Essex, said that at Chelmsford Borough Market, when inspecting animals there, he noticed that a red and white cow had both hind quarters of the udder enlarged and he found them to be hard. He was suspicious of tuberculosis. He was informed that Sanders was the owner and under Article 12 of the Order he gave him the option of moving the cow back to where it came from or having it slaughtered. Defendant chose the latter course, and it was taken to a knackery. Before this witness took a sample of the milk and found it contained tubercle bacilli.

Answering the Chairman, witness said that Sanders admitted that he knew the udder was enlarged. Continuing, Mr. Sheppard observed that the presence of the disease would be apparent to any layman. Any person drinking the milk would be in grave risk of contracting tuberculosis. The cow was exposed as a fat cow, presumably for slaughter.

A police witness told the court that the defendant Handley informed him that the animal was sold as an old cow. She was in good bodily condition, though one quarter of her udder was swollen, but it went down when it was bathed. Had he known the udder was tuberculous he would have had the cow destroyed. Handley bought the cow in 1928 with its second calf. The calf it had just fatted was its tenth. Witness added that from inquiries he had made he had found the milk from the cow was not sold, it was used for fatting the calf.

Sanders said he saw the knackerman, who stated that the cow was clean except that it had garget in the udder.

Handley, who said he was quite innocent of the charge, stated that he had "doctored the cow for garget." He put none of her milk in his churns; he never did when a cow was sick. He had no idea the cow had tuberculosis, and if he had he would have reported it to the police and not sold it.

Cross-examined, defendant agreed he did not know what the cow was suffering from and took no steps to find out.

Answering a magistrate, defendant said it was some time since he had had a veterinary surgeon out to his place.

When it was pointed out to him by the police superintendent that the label on the bottle of medicine he used for the cow did not mention that it was for swollen udders, defendant said that he had seen a picture of a cow with a great big bag and one man saying to another that one bottle of the medicine would cure it. (Laughter.)

Defendant: "It's the truth, sir."

The Bench fined each defendant £2.

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BOURNEMOUTH TYPHOID OUTBREAK

Further official figures as to the number of typhoid fever cases in Bournemouth, Poole and Christchurch during the recent milk-borne epidemic were made available on September 4th. The number of cases notified in Bournemouth up to that date was 222, in Poole 143, and in Christchurch 20. There were six deaths in Bournemouth and one in Poole.

An official report from a special committee set up to deal with the outbreak in Bournemouth flatly contradicted persistent rumours that the number was much higher than the figures quoted, and stated that they were exact. The report (September 4th) added:—

"The committee are advised that the general period of incubation expires to-day, and there is therefore good reason for expecting a day-to-day diminution of the number of cases. There was a big reduction yesterday, and there are indications of a steady decline in the incidence of the disease. All the necessary hospital accommodation has been obtained, together with extra and fully-qualified medical, nursing and domestic assistance. An excellent site has been obtained for hospital accommodation in a large residence in a favourable situation in Bournemouth. The whole of the milk supply from which contaminated milk was obtained is being pasteurised, and, in fact, has been pasteurised since the commencement of the outbreak. The medical officers of the Ministry of Health are working in collaboration with the Council and its officials, and they are satisfied that the indications are of a steady decline."

Dr. Vernon Shaw, of the Ministry of Health, who visited Bournemouth in connection with the outbreak, said on the same date: "The daily diminution in the number of cases of typhoid coming to the notice of the Public Health Department indicates that the course of the outbreak is following the favourable trend to be expected."

SIR LEONARD HILL ON MILK POLLUTION

Sir Leonard Hill, delivering his presidential address at the annual conference of the Sanitary Inspectors' Association at Harrogate, referred to various aspects of national health. Stating that the pollution of milk remained a serious cause of disease, Sir Leonard observed that the modern use of big containers spread infection. There were some 2,000 deaths a year of children from bovine tuberculosis. By the contamination of milk by human carriers there were spread septic sore throats, scarlet fever, diphtheria, typhoid, and dysentery. All such milk infection could be stopped by efficient pasteurisation or by boiling milk. As to Sir Frederick Hopkins's suggestion that there should be three grades of milk—"tuberculin tested, pasteurised, and milk," the Ministry, ignoring that wise recommendation, had instituted a grade called "accredited," which the public naturally would consider safe, while actually its production gave no security against milk-borne infections. Policy was ruled by commercial interests and not by science.

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ATTESTED HERDS SCHEME

Herds of cattle in Great Britain registered under the Ministry of Agriculture's attested scheme as being free from tuberculosis numbered 266 at the end of August. Of these, 144 are in Scotland and 122 in England and Wales. The bulk of the Scottish herds are in Ayrshire, South of the Border, Carmarthenshire leads with 30 herds, Pembrokeshire has 15 and Cardiganshire 13. In England, Kent has 12, Suffolk 10 and Sussex 9.

Scotland's lead is attributed partly to the fact that producers of tuberculin-tested milk come under the Scottish Milk Marketing Scheme. In England and Wales they do not. Only 31 out of the 122 attested herds in England and Wales are producing tuberculin-tested milk. The other 91 are producers under the Marketing Scheme.

Producers of tuberculin-tested milk in England and Wales now exceed 1,000. The Ministry of Agriculture believe that if, and when, these producers are brought under the control of the Milk Marketing Board, many of them will apply for registration under the attested scheme. It is estimated that at least 500 of these herds could qualify under the attested scheme without delay.

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INTERNATIONAL HORSE SHOW

The International Horse Show will be held next year from Thursday, June 17th, to Saturday, June 26th (inclusive). The directors have been obliged to hold the show at this time because of an alteration in the dates of the Royal Tournament on account of the Coronation.

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IMPORTATION OF LIVESTOCK INTO IRELAND: RESTRICTIONS RELAXED

The Ministry of Agriculture has been notified of the relaxation of the restrictions on the importation of livestock into Northern Ireland and the Irish Free State. In future consideration will be given to applications for permits for the importation of ruminating animals and swine direct from farms in England and Wales to farms in Northern Ireland, and direct from farms in Great Britain to farms in the Irish Free State; that is, without the necessity of the animals passing through the London Quarantine Station.

This modification will, however, be applicable to animals intended for breeding purposes only, and will be contingent on no unfavourable developments in the meanwhile as regards foot-and-mouth disease in Great Britain.

Correspondence

The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

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EXPORT OF LIVESTOCK TO JERSEY

To the Editor of the Veterinary Record.

Sir,—I notice under the above heading at page 1060 in the *Veterinary Record* of September 5th that "swine over six months old must be accompanied by a certificate showing that they have been tested with tuberculin by the intradermal method and found free from tuberculosis." I am sure it would be of interest to the profession if any veterinary surgeon who undertakes this work would give an account in detail of the procedure he adopts and the general results he obtains. As far as I know, very little has been written about the tuberculin testing of pigs.

Yours sincerely,
G. Mayall, M.R.C.V.S.

Bolton,
September 7th, 1936.

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"WATER POISONING" IN CALVES

To the Editor of the Veterinary Record.

Sir,—On May 5th of this year I encountered three cases which resembled what Mr. F. Harvey described as "water poisoning" in the following week's issue of the *Record*.

Five calves, aged three to five months, hitherto fed on scalded milk and hay, were put into a field, through which ran a stream. Within twelve hours two showed the following nervous symptoms: Waving of the head, loss of equilibrium, followed later by convulsions and coma. Death occurred in 24 and 48 hours after the onset of symptoms. A third calf showed slight symptoms, but recovered in the course of three or four days.

A *post-mortem* examination on one of the calves (the other being too decomposed) revealed no obvious abnormality.

No haematuria or haemoglobinuria (such as Mr. H. Llewelyn Jones describes in to-day's *Record*) was observed, but may have been present to a slight degree, as urine examinations were not made.

Yours faithfully,
E. W. Ascoli, M.R.C.V.S.

112, Boutport Street,
Barnstaple. *September 5th*, 1936.

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EXAMINATION FOR SOUNDNESS: CARDIAC ABNORMALITIES

To the Editor of the Veterinary Record.

Sir,—With reference to Mr. Miles' letter in the current issue of the *Veterinary Record*, may I suggest that the metallic sound to which he refers may be the *bruit d'airain* heard in advanced cases of bronchitis complicated by bronchiectasis and is due to the passage of air through fluid in the chest. This metallic sound is only produced after exertion. It is not a heart sound, but in such advanced cases of bronchitis there is dilatation and hypertrophy of the right side of the heart. This is followed by failure of compensation with heart murmurs and auricular fibrillation, and oedema. I make this suggestion as a possible explanation: I should hesitate to dogmatise on the brief synopsis of his case supplied by Mr. Miles.

Reverting to former correspondence on "Wind," may I quote F. Smith (*Veterinary Physiology*) ". . . as a matter of fact Wind is largely a question of Heart."

Yours faithfully,
J. Cochrane-Dyet.

Craven Lodge,
Melton Mowbray. *September 6th*, 1936.